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EXAMINER

AZAD, ABUL K

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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Paper No. 15

Application Number: 09/392,124  
Filing Date: September 08, 1999  
Appellant(s): CHRISSAN ET AL.

\_\_\_\_\_  
Robert J. Crawford  
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed March 17, 2003.

**(1) *Real Party in Interest***

A statement identifying the real party in interest is contained in the brief.

**(2) *Related Appeals and Interferences***

The applicant stated that there are no other appeals or interferences that will directly affect, or be directly affected by, or have a bearing on the Board's decision in the appeal.

**(3) *Status of Claims***

The statement of the status of the claims contained in the brief is correct.

**(4) *Status of Amendments After Final***

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

**(5) *Summary of Invention***

The summary of invention contained in the brief is deficient because, both applicant's invention and Bialik's (US 5,568,588) are same. One can compare instant applicant's application figures 1 and 2 with reference's figures 1 and 2, there are no differences in between them, where references Figure 2 is more descriptive than the Figure 2 of the instant application.

**(6) *Issues***

The appellant's statement of the issues in the brief is correct.

**(7) *Grouping of Claims***

Appellant's brief includes a statement that claim 28 do not stand or fall together and provides reasons as set forth in 37 CFR 1.192(c)(7) and (c)(8).

**(8) Claims Appealed**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(9) Prior Art of Record**

5,568,588                      Bialik et al.                      10-1996

Sklar, B. "Digital Communications Fundamentals and Application" Prentice Hall (Oct 9, 1987), pp. 61-65

**(10) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1-27 and 29-32 are rejected under 35 U.S.C. 102 (b) and claim 28 is rejected under 35 U.S.C. 103 (a). These rejections are set forth-in prior Office action, Paper No. 10 and are reproduced below for convenience.

Claims 1-27 and 29-32 are rejected under 35 U.S.C. 102 (b) as being anticipated by Bialik (US 5,568,588).

As per claim 1, Bialik teaches, "in a speech processing system including a signal processor arrangement that analyzes an input speech signal and, in response, generates the short-term characteristics of the input speech signal and a target vector, a method of analyzing the input speech signal comprising:"

"generating from the target vector and the short term characteristics, a plurality of sequences of variable-amplitude pulses, each of the sequences having a different average amplitude value" (Fig. 1, element 10 a short term prediction analyzer, element 13 target vector generator, element 20 pulse location determiner and element 38 pulse sequence which matches target vector; col. 4, lines 12-51, particularly reads on,

Art Unit: 2654

"typically has a value of 3 separate gain levels . . . the gain level selector 24 receives the gain range produced by gain range determiner 22 and move through the gain values within the gain range. Its output, on output line 32, is current gain level for each sequence of equal amplitude pulses to obtained", from this statement it is clear that for each gain level the system will obtain a different amplitude of pulses, so for output of multiple gain levels of pulses will obtain a sequence of variable-amplitude, and so a different average amplitude value pulses; also teaches at col. 5, line 55 to col. 6, lines 27); and

"outputting a signal corresponding to a sequence of equal-amplitude pulses which, according to an error criterion, represents the target vector" (col. 6, lines 38-42, particularly reads on in step 76, target vector matcher 28 determines the value of global criterion  $GC_j$  for each gain level  $j$ ", where previously teaches at col. 4, lines 12-42, that each gain level produces equal-amplitude pulses).

As per claim 2, Bialik teaches, "wherein the target vector is matched using a perceptual weighting criterion" (col. 6, lines 42-44, particularly reads on "for such a criterion, target vector matched 28 includes a perceptual weighting filter").

As per claim 3, Bialik teaches, "a speech processing system including a signal processor arrangement that analyzes an input speech signal and, in response, generates the short-term characteristics of the input speech signal and a target vector, comprising:"

"means for generating from the target vector and the short term characteristics, a plurality of sequences of variable-amplitude pulses, each of the sequences having a

Art Unit: 2654

different average amplitude value" (Fig. 1, element 10 a short term prediction analyzer, element 13 target vector generator, element 20 pulse location determiner and element 38 pulse sequence which matches target vector; col. 4, lines 12-51, particularly reads on, "typically has a value of 3 separate gain levels . . . the gain level selector 24 receives the gain range produced by gain range determiner 22 and move through the gain values within the gain range. It output, on output line 32, is current gain level for each sequence of equal amplitude pulses to obtained", form this statement it is clear that for each gain level the system will obtained a different amplitude of pulses, so for out put of multiple gain levels of pulses will obtain a sequence of variable-amplitude, and so a different average amplitude value pulses; also teaches at col. 5, line 55 to col. 6, lines 27); and

"means for outputting a signal corresponding to a sequence of equal-amplitude pulses which, according to an error criterion, represents the target vector" (col. 6, lines 38-42, particularly reads on in step 76, target vector matcher 28 determines the value of global criterion  $GC_j$  for each gain level  $j$ ", where previously teaches at col. 4, lines 12-42, that each gain level produces equal-amplitude pulses).

As per claim 4, Bialik teaches, "wherein the target vector is matched using a perceptual weighting criterion" (col. 6, lines 42-44, particularly reads on "for such a criterion, target vector matched 28 includes a perceptual weighting filter").

As per claim 5, Bialik teaches, "a speech processing system including a signal processor arrangement that analyzes an input speech signal and, in response,

Art Unit: 2654

generates the short-term characteristics of the input speech signal and a target vector, comprising:"

"an analyzer adapted to receive the target vector and the short term characteristics and to generate a plurality of sequences of variable-amplitude pulses, each of said sequences having a different average amplitude value" (Fig. 1, element 10 a short term prediction analyzer, element 13 target vector generator, element 20 pulse location determiner and element 38 pulse sequence which matches target vector; col. 4, lines 12-51, particularly reads on, "typically has a value of 3 separate gain levels . . . the gain level selector 24 receives the gain range produced by gain range determiner 22 and move through the gain values within the gain range. It output, on output line 32, is current gain level for each sequence of equal amplitude pulses to obtained", from this statement it is clear that for each gain level the system will obtained a different amplitude of pulses, so for out put of multiple gain levels of pulses will obtain a sequence of variable-amplitude, and so a different average amplitude value pulses; also teaches at col. 5, line 55 to col. 6, lines 27);

"the analyzer being further adapted to output a signal corresponding to a sequence of equal-amplitude pulses which, according to an error criterion, represents the target vector" (col. 6, lines 38-42, particularly reads on in step 76, target vector matcher 28 determines the value of global criterion  $GC_j$  for each gain level  $j$ ", where previously teaches at col. 4, lines 12-42, that each gain level produces equal-amplitude pulses).

As per claim 6, Bialik teaches, "wherein the target vector is matched using a perceptual weighting criterion" (col. 6, lines 42-44, particularly reads on "for such a criterion, target vector matched 28 includes a perceptual weighting filter").

As per claim 7, Bialik teaches, "a speech processing system including a signal processor arrangement that analyzes an input speech signal and, in response, generates the short-term characteristics of the input speech signal and a target vector, comprising:"

"a multi-pulse analyzer adapted to receive the target vector and the short term characteristics and to generate a plurality of sequences of variable-amplitude, variable-sign and variably-spaced pulses, each of said sequences having a different average amplitude value, each of said pulses within each sequence having variable amplitudes and variable signs" (Fig. 1, element 10 a short term prediction analyzer, element 13 target vector generator, element 20 pulse location determiner and element 38 pulse sequence which matches target vector; col. 4, lines 12-51, particularly reads on, "typically has a value of 3 separate gain levels . . . the gain level selector 24 receives the gain range produced by gain range determiner 22 and move through the gain values within the gain range. It output, on output line 32, is current gain level for each sequence of equal amplitude pulses to obtained", from this statement it is clear that for each gain level the system will obtained a different amplitude of pulses, so for out put of multiple gain levels of pulses will obtain a sequence of variable-amplitude, and so a different average amplitude value pulses; also teaches at col. 5, line 55 to col.

6, lines 27; also Bialik teaches, "the pulse sequence is series of positive and negative pulse sequence having the current gain");

"the multi-pulse analyzer being further adapted to output a signal corresponding to a sequence of equal-amplitude, variable-sign, variably-spaced pulses which, according to a maximum likelihood criterion, most closely represents the target vector" (col. 6, lines 38-42, particularly reads on in step 76, target vector matcher 28 determines the value of global criterion  $GC_j$  for each gain level  $j$ ", where previously teaches at col. 4, lines 12-42, that each gain level produces equal-amplitude pulses and variable-sign and variably-spaced pulses).

As per claim 8, Bialik teaches, " wherein the target vector is matched using a perceptual weighting criterion" (col. 6, line 42-44, particularly reads on "for such a criterion, target vector matched 28 includes a perceptual weighting filter").

As per claim 9, Bialik teaches, "wherein the pulse amplitude variations are based on at least one of the exponential function; a linear function; the short-term characteristics of the input speech signal; the long-term characteristics of the input speech signal; and the excitation signal from previous frames" (Fig. 5, elements 10, 12, and col. 5, lines 1-15, impulse response is a function of short-term characteristics  $a_l$  provided along line 17 from analyzer 10").

As per claims 10-27, they are interpreted, thus rejected for the same reasons set forth in the rejection of claims 1-9.

Art Unit: 2654

As per claim 29, Bialik teaches, "wherein the pulse-train sequence modification function is based on a linear function" (col. 4, line 55 to col. 5, line 65, equation 2 is a linear function).

As per claim 30, Bialik teaches, "wherein the pulse-train sequence modification function is based on the short-term characteristics of the input speech signal" (col. 4, lines 55-65, short-term characteristic).

As per claim 31, Bialik teaches, "wherein the pulse-train sequence modification is based on the long-term characteristics of the input speech signal" (col. 3, lines 41-48, long-term analyzer).

As per claim 32, Bialik teaches, "wherein the pulse-train sequence modification function is based on the excitation signal from previous frames" (col. 6, lines 11-18, reads on "in step 62, determiner 25 updates the local criterion with the previous pulse as follows equation 7").

Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bialik et al. (US 5,568,588).

As per claim 28, Bialik does not explicitly teach modifying the pulse train based on the exponential function. Official Notice is taken on the well-known in the art of speech processes to use pulse trains constructed based on the exponential function. It would have been obvious to one of ordinary skill in the art at the time of the invention to use pulse-train sequence modification function is based on the exponential function because output speech quality is greatly increased, and perceptually smooth. Such a

well-known pulse train construction is taught by Bernard Sklar's text Book Digital Communications Fundamentals and Applications at Page 63, equations 2.10 and 2.11.

**(11) Response to Argument**

The applicant argues in Paragraph 3, of Page 4, of the brief, "contrary to applicant's claimed invention, the Bialk '588 reference does not teach, "generating from the target vector and the short term characteristics, a plurality of sequences of variable-amplitude pulses"".

The examiner disagrees with the applicant's assertion because Bialik teaches this limitation at Fig. 1, element 10 represents a short term prediction analyzer, element 13 represent a target vector generator, element 38 a pulse sequence which matches a target vector, at element 38 a plurality of sequence of variable-amplitude pulses will be produced. In figure 1, element 24 represent a gain level selector, where gain level selector will select different gain level (see col. 4, 12-18 and col. 5, lines 55-65, typically value of 3 separate gain level), and repetitively producing pulse sequence at element 38, by repetitive element 36, after completing to produce a pulse sequence for all level, at element 38 a plurality of variable-amplitude pulses will be produced, where each sequence have different average amplitude or each sequence have equal-amplitude pulses for each gain level as claimed. Bialik teaches at col. 4, lines 12-51, particularly reads on, "typically has a value of 3 separate gain levels . . . the gain level selector 24 receives the gain range produced by gain range determiner22 and move through the gain values within the gain range. It output, on output line 32, is current gain level for each sequence of equal amplitude pulses to obtained", form this statement it is clear

Art Unit: 2654

that for each gain level the system will obtain a different amplitude of pulses, so for out put of multiple gain levels of pulses will obtain a sequence of variable-amplitude, and so a different average amplitude value pulses. Therefore, for the long run it will produce a plurality of sequences of variable-amplitude pulses, each of the sequences having a different average amplitude that means each sequence have a sequence of equal-amplitude of pulse. The examiner also asserts that the instant application's invention and the reference invention is same the Figures 1 and 2 of instant application and the Figures 1 and 2 of reference are same and their descriptions are same. Also, the reference is covered for same claim limitation see claim 1 and 10, "each of said sequences having a different amplitude value" or "each of said sequences of trains of pulses having a different amplitude value".

The applicant further argues at last paragraph of Page 6 and 1<sup>st</sup> paragraph of page 6 of the Brief, "applicant's invention is directed to a plurality of sequences of variable-amplitude pulses, whereby the amplitudes of the pulses within a single sequence are different and related by a mathematical formula. In contrast, the '588 reference is directed to a plurality of sequences of equal-amplitude pulses wherein each sequence in the plurality of sequences has different gain value. The pulse within a single sequence of the '588 reference are of equal amplitude and therefore not structured and related by a mathematical formula (e.g.; exponential function)".

The examiner disagrees with applicant's above assertion because the applicant does not claim "the amplitude of the pulses within a single sequence are different" instate the applicant claimed as "each sequence having a different average amplitude

value and outputting a signal corresponding to a sequence of equal-amplitude pulses which, according to an error criterion, representing the target vector". Therefore, it is clear that the applicant and the reference have similar teaching. As per claim 28, the examiner acknowledged that Bialk fails to teach modifying the pulse train based on the exponential function. However, the examiner take an Official Notice on the well-known in the art of speech processes to use pulse trains constructed based on the exponential function. It would have been obvious to one of ordinary skill in the art at the time of the invention to use pulse-train sequence modification function is based on the exponential function because output speech quality is greatly increased, and perceptually smooth. Such a well-known pulse train construction is taught by Bernard Sklar's text Book Digital Communications Fundamentals and Applications at Page 63, equations 2.10 and 2.11. Where, Sklar teaches that the periodic (speech is periodic) pulse train can be express as a Fourier series in the form of equation of 9 as exponential function.

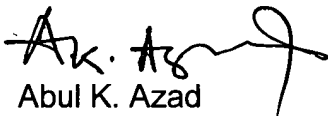
The applicant further argues at 4<sup>th</sup> Paragraph, of Page 7 of the Brief, the examiner has failed to provide evidence of motivation for making the asserted modification of the '588 reference".

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re*

Art Unit: 2654


*Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the motivation is it would have been obvious to one of ordinary skill in the art at the time of the invention to use pulse-train sequence modification function is based on the exponential function because output speech quality is greatly increased, and perceptually smooth. Such a well-known pulse train construction is taught by Bernard Sklar's text Book Digital Communications Fundamentals and Applications at Page 63, equations 2.10 and 2.11. For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

  
Abul K. Azad  
June 16, 2003

Appeal Conference (06/13/2003) Conferees:

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